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Suture Lifting and Liposculpture Integration in the Creation of Facial Esthetic Harmony

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1. Introduction

Youthful esthetic facial enhancement can be created with natural and scarless outcomes if innovative and minimally invasive surgical principles are properly employed. Feminine facial beauty can be characterized through mathematical, geometric and architectural constructs. However it is the triad of esthetically revealed eyes, curvaceous undulating cheek-lip landscape and a well defined jawline that hallmarks radiant feminine appeal.

In the contemporary setting numerous minimally invasive and non-invasive treatments are available for facial rejuvenation and beautification. Judicious use of soft tissue fillers, botulinum toxin, skin lasers, photothermics, platelet rich dermal stimulant therapies, chemical peels and bioactive topical applications have variously enabled cosmetic practitioners to exploit an intensifying non-invasive treatment armamentarium. In concert with these treatments, blepharoplasty using radiofrequency technology can be considered as a minimally invasive procedure. In lower lid blepharoplasty, the transconjunctival approach does not result in external scars at all. In the upper lid incision scars are very small and in time barely detectable when hidden in the natural upper eyelid crease.

It can be argued that traditional invasive rhytidectomy is a comparatively overly aggressive and in many circumstances obsolete procedure that should be reserved for relatively elderly case presentations or reconstructive situations. We have found the utilization of percutaneous suture lifting of flaccid or ptotic facial tissues can provide for a natural scarless alternative to invasive rhytidectomy surgery with the added advantage of respecting natural tissue vectors and contours. This is particularly important as the overly common "windswept" appearance associated with outcomes of traditional rhytidectomy can be avoided using percutaneous sutures without excision.

Furthermore, in appropriate cases the disciplines of liposculpture and percutaneous suture lifting can be synergistically integrated to attain a natural and esthetically pleasing facial harmony for the patient.

2. History

Historically there has been a steady evolution of percutaneous lift methods. Some techniques unfortunately did not achieve sufficient outcome durability and were accompanied by side effects and complications that included thread migration and extrusion. Rachel et al conducted a retrospective study reviewing 29 cosmetic patients evaluating the morbidity associated with a polypropylene barbed thread lifting technique and its long-term effects. This study demonstrated adverse events in 69% and early recurrence in 45% of the patients. The adverse events that occurred most commonly were pain, dimpling, visible threads, and foreign body reactions. ^[1]

Abraham et al in their study claimed that thread lift procedures provided only a limited, short term improvement that may have been largely attributed to post procedural edema and inflammation. Furthermore they asserted that the examined thread lifts relied on a similar basic technique involving subcutaneous placement of cogged threads along a planned trajectory, the threads being pulled to achieve the desired skin lift, secured and trimmed at the entry point. ^[2]

However such studies do not apply to certain well sustained and successful percutaneous thread lift techniques. Technique integrity necessitates methods that must be ingenious in anatomical design, providing for acceptable long term tissue suspension outcomes without significant side effects and risks.

The authors have found the percutaneous suture technique concepts invented by Serdev, N fulfill such requirements. Serdev has devised percutaneous suture lift techniques that are differentiated by the amalgamation of firmly anchored fixation of suspended lax soft tissues and non-barbed polycapramide sutures with an extended period of absorption delay. ^[3]

Furthermore Serdev techniques often incorporate relatively deeper anatomical suture passes that enhance outcomes while avoiding impacts and potential injury to critical neurovascular structures. The authors are not aware of any other percutaneous suture lift design constructs that incorporate such innovative features that serve to reinforce the security, viability and extended duration of the desired tissue suspension. (*Detailed descriptions of the Serdev techniques authored by the inventor can be found elsewhere in this book.*)

3. Correction of anatomical pathology in midface aging

The authors regard enhancement of the eyes and midface as being critical to successful and youthful facial beautification. However the aging midface has always been a challenging region for cosmetic surgeons. Traditional techniques are complex and variably incorporate invasive rhytidectomy, malar implants and midface elevation with intraoral, temporal

incisions or transcutaneous lower blepharoplasty incisions. Wulc & Hartstein wrote that “many of the procedures that have been innovated over the past 20 years are complex and are associated with steep learning curves and new complications. Some of these complications are difficult to manage. Some surgeons are sceptical of the longevity of the procedures designed to correct changes in this area. Many have adopted a particular procedure, only to have abandoned midface surgery altogether for any of these reasons.”^[4]

However all surgical considerations must take into account the pathological basis for midface aging which is characterised by changes in the central third of the face.^[5] Structural changes develop with rhytid formation, progressive soft tissue ptosis and tissue atrophy.

The ideal youthful face is a proportional construct featuring a curvaceous convex into concave “S” shaped facial landscape known by the architectural definition of the “Ogee” curve.^[6]

The youthful midface is characterized by prominent cheeks with a smooth transition between the lower eyelid-cheek interface which is an important aesthetic continuum and also a significant indicator of facial beauty. It is important to appreciate the lid-cheek interface is situated above or at level of the orbital rim in youth but with aging descends below the orbital rim. With midface aging the malar fat pad can atrophy and descend inferomedially over the SMAS with the development of a sulcus below the inferior eyelid. Correction involves vertical or superolateral elevation of an adequately volumized malar fat pad in order to restore a youthful midface esthetic.^{[7], [8]}

The retaining ligaments of the malar fat pad and midface consist of the orbital retaining ligaments and lateral orbital thickening.^[9] It should also be considered in relation to lower eyelid fat pad herniation that additional to the anterior migration that occurs through a weakened orbital septum, orbitomalar ligament fatigue permits an inferior migration of orbital fat. The diminished integrity of these facial retaining ligaments is fundamental in the pathogenesis of the soft tissue ptosis.

Suspension of the malar fat pad, suborbicularis oculi fat (SOOF) along with reconstitution of the orbibomalar ligament re-mounds the midface and supports (from below) the lower orbital soft tissue structures. With aging, sulcus formation occurs in the osseous insertions of these elongated ligaments, creating sunken appearance in this region.

Laferriere et al reported a percutaneous suspension technique of the malar fat pad anchored to deep temporalis fascia, repositioned it in a more youthful position. It was observed that this minimally invasive technique produced a long lasting elevation that would be a welcomed addition to midface rejuvenation.^[10]

However the Scarless Serdev suture^R percutaneous midface technique (“Cheekbone Lift”) appears to be a unique construct on the basis that an inherent percutaneous ligamentous repair is established within the actual procedure. Unlike the case in traditional open surgery where invasive dissection and ligament release is often required before securing tissue elevation, Serdev’s percutaneous midface technique does not necessitate ligamentous

interruption prior to mobile tissue elevation. The lax mobile tissues to be lifted may include the malar fat pad, SOOF and what Serdev describes anatomically as “mobile muscle-cheek SMAS flap or fascial tube of buccal fat pad (also called Bichat’s fat pad)”. (*Detailed descriptions of this and other Serdev techniques authored by the inventor can be found elsewhere in this book.*)

It is important to appreciate that these facial soft tissue structures are elevated and suspended by suture fixation variously to the zygomatic periosteum “and in selected cases to orbital rim periosteum or temporoparietal tendon insertion and underlying periosteum, or upper temporal line periosteum and temporal fascia”. [11] Thereby ligament laxity is not interrupted but instead effectively repaired with a concurrent elevation and fixation of these lax soft tissues. The procedure is conceptually ingenious while elegant in its simplicity.

Complimentary to the cheekbone lift is the concept of the Serdev Scarless Serdev suture^R midface lift that sutures loose zygomatic SMAS extension to temporoparietal tendon insertion and underlying temporal periosteum. This technique achieves remarkably firm and secure fixation. [12] Naturally mounded or previously enhanced cheekbone tissues are elevated into a natural and youthfully vectored position. In essence the mid and lower face is securely suspended in a diagonal superolaterally directed elevation. This provides for a naturally inclined correction of the tissue fall induced by aging.

4. Synergistic integration of suture lifting and liposculpture

While the suspension of the aging midface is a key region for the restoration of youthful aesthetics, the authors have observed that enhancement of the midface is often more achievable after liposculpture has been performed in appropriate cases of submandibular soft tissue redundancy. This is an important consideration in the quest to optimize esthetic outcomes and was observed recently by Bisaccia et al who described the use of specialized 3-0 polypropylene sutures with absorbable cones to suspend platysma with combined, on occasions, with neck liposuction techniques to elevate sagging tissues of the face and neck, concluding that the technique had proven to be a useful addition to facial rejuvenation. [13]

Liposculpture is a very effective method of rejuvenation in the lower face, particularly in the submandibular region and jowls. It is a viable and minimally invasive alternative to traditional surgical face lifting particularly when combined with well anchored percutaneous suture lifting techniques as in the methods described by Serdev.

From an historical perspective, cosmetic surgeons performing formal face lifting have long recognized the need to consider concurrent neck liposculpture in appropriate cases of submandibular adipose accumulation. Adamson et al. observed that obtaining ideal results with cervico-facial rhytidectomy had frustrated facial plastic surgeons due to the difficulty of removing local excesses of adipose tissue in the submental, submandibular and other facial regions. They noted that open and closed liposuction techniques were being developed in conjunction with face lifting to improve the definition of the facial, mandibular and cervical contours. [14]

Over the several years we have observed that submandibular liposculpture not only improved the target anterior neck and lower face aesthetic but also seemed to improve the midface aesthetic. This is particularly so in younger patients. We have noted that certain other procedural strategies can be synergistic in the attainment of aesthetic facial harmony. Analysis of a patient's potential for an harmonious fascial aesthetic can focus the surgeon's treatment strategy. In suitable cases facial treatment favoring elimination of any prominent anterior neck laxity, ptosis and/or fat accumulation is preferable before attempting other aesthetic procedures for midface and perhaps even upper face enhancement.

This observation is consistent with Fournier's philosophy of esthetic semiology which implies that an interaction or interrelationship may exist between neighbouring tissues. [15] Fournier made particular reference to the contribution of the gravity, weight, hypertrophy or ptosis of the buttocks on the generation of lateral thigh or "saddlebag" deformity. Furthermore in cases where isolated volume reduction of the buttocks alone eliminated the anatomically inferior saddlebag deformity, the term "pseudo-saddlebag" deformity was coined. Fournier indicates that, along with other factors, errors in liposculpture technique can include miscalculation of the exact cause of a targeted fat accumulation. In order to determine the nature or aetiology of age related accumulation or ptosis of fat in many regions of the body, Fournier proposed that an analysis of various passive tissue maneuvers or active muscle contractions should be made to assess tissue semiology. As the human body is naturally appreciated in the vertical perspective, the most obvious semiological factor to consider is gravity. Fischer, G. described performing liposculpture on a theatre table that is engineered to tilt vertically, enabling the effect of gravity on the tissues to be best appreciated during the actual procedure. Some other practitioners take the opportunity during the procedure to intermittently stand the patient in order to assess this effect. Fischer terms his technique "orthostatic liposculpture". [16]

Accordingly the impact of gravity must always be factored in any treatment plan. Such considerations relate to the expected influence of the gravity and weight of a superior tissue region on inferior location. However we have observed how the reduction of the inferiorly located submandibular adiposity can improve a superiorly located midfacial ptosis or projection insufficiency. We have termed this rather unexpected observation to be an example of "gravity inverted aesthetic semiology". Another example of this "gravity inverted" tissue interrelationship is the creation of the superiorly located "axillary roll" (or perhaps better phrased as "pseudo-axillary roll") in certain cases of the inferiorly located breast hypertrophy.

Zins et al concluded that young patients with minimal sub-platysmal fat can be treated by liposuction alone, reserving surgical skin excision for patients with severe skin excess or laxity. [17] However in most of these circumstances percutaneous suture lifts without recourse to skin excision provide for excellent tissue elevation, minimal trauma and without the imposition of scars for the patient.

5. Methodology

Traditional techniques are utilized for submandibular liposculpture with the aspirated fat (platelet rich plasma (PRP) enhanced) for transfer grafting to the midface if there is an indication of significant tissue atrophy in that region.

Fundamentally we have observed that closed suture lifting outcomes can be enhanced due to less strain imposed on the sutures. In other words we are “asking less” of the sutures by lightening the tissue load burden on them, diminishing the risk of suture fatigue and tissue suspension failure. Accordingly in appropriate cases, correction of a coexisting submandibular laxity by liposculpture lays the foundation for improved outcomes in minimally invasive closed suture face lifting and ultimately in other facial enhancement procedures.

Outcomes are readily observed clinically. We postulate that this midface enhancement is perhaps greater than one may expect from subtraction of sub-mandibular weight or the gravity “pull” effect alone. Indeed the subtracted tissue weight loss is generally minimal (20-60 grams fat). As Fournier suggests the totality of the aesthetic improvement is semiologic, possibly influenced by the interplay of factors such as physical mass, muscle tone, vascular, biochemical and hormonal changes in the altered regional tissue balance.

The following outlines our treatment method of a submandibular laxity/adipose accumulation in the aesthetic enhancement of both lowerface and midface disharmony.

All procedures are undertaken in the clinic operating theatre under local anesthetic tumescence (Klein type) alone. ^[18] Some patients elected to have a pre-med of oral Lorazepam 1mg 1hour before the procedure. We use one and two hole 1.5mm, 2mm & 3mm diameter liposculpture canulae and use a criss-cross (fanning) liposculpture technique. The liposculpture is performed anterior to the platysma. The marginal mandibular nerve and indeed all major vessels, nerves and endocrine gland structure lie deep to the platysma. We have found that the progressive development of a fibrous mesh support that occurs over several months is as important as the actual volume of fat removed. We have encountered no significant infections, bleeding or neural damage with this technique.

Following the liposculpture (either contemporaneously or a later date), suture lifting in the cheek and/or midface is undertaken in manner of the Serdev methods described earlier.

There seems to be a logical advantage when possible in delaying suture lifting until after the maturation of the liposculpture occurs over several months as swelling is diminished and tissue contraction maximized. The ptosed and redundant submandibular neck tissues can be seen to have been elevated and the mentocervical angle generally improved to 90-120 degrees. This is inherently associated with elongation of the neck which in itself is a very pleasing esthetic phenomenon. The soft tissue neck redundancy and ptosis having been corrected allows for powerful and secure percutaneous suture lifting, theoretically possible in all methods. However our own experience favors the combined cheekbone lift and midface lift in the manner of the aforementioned Scarless Serdev Suture^R methods. *[Figures 1. & 2.]*



(a)



(b)



(c)

Figure 1. 60 year old patient with midface atrophy and ptosis with associated with submandibular adipose accumulation and laxity. Note natural scarless outcome with esthetic angles and contours.

(a) Prior to treatment

(b) Post submandibular liposculpture

(c) Post subsequent Serdev type percutaneous cheek and midface suture lifts

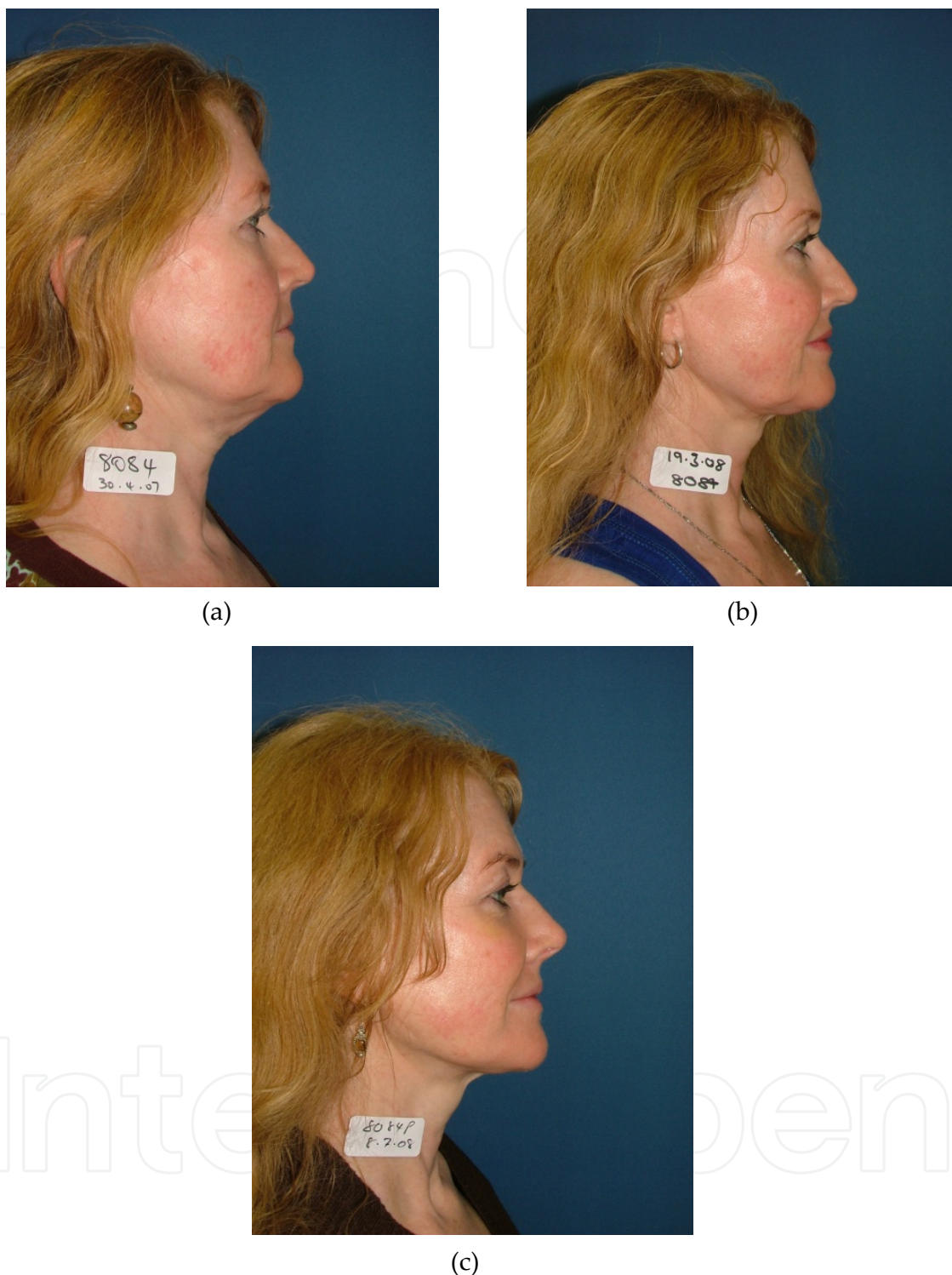


Figure 2. 50 year old patient with midface atrophy and ptosis with associated with submandibular laxity. Note natural scarless outcome with esthetic angles and contours.

(a) Prior to treatment

(b) Post submandibular liposculpture with fat transfer graft to midface (plus Serdev type percutaneous suture brow lift)

(c) Post subsequent percutaneous cheek and midface suture lifts (plus Serdev type percutaneous nasal tip lift and lip augmentation by hyaluronic fillers)

Risks and major side effects are few when these techniques are properly mastered.

The combined risks and side effect profile of both treatment methods include infection, vascular trauma, neurological trauma, endocrine gland trauma and suboptimal outcomes.

In practice we have only experienced very occasional and trivial side effects that have resolved either spontaneously or with minor interventions. Specifically with percutaneous suture lifting, capture of dermal tissue in the sutures can result in skin tethering. However with experience and careful technique this risk can be minimized and if necessary corrected by tissue manipulation or even careful subcision.

Importantly for patient acceptance, both minimally invasive facial suture lifts and liposculpture techniques are easily achievable under local anesthetic alone. If required local anesthesia can be augmented by mild sedation.

6. Conclusion

The universal popularity for non-invasive aesthetic facial enhancement using commercial soft tissue fillers, botulinum toxin and skin photothermics/ lasers is well justified with excellent outcomes possible in the hands of creative surgeons. However none of these therapies can significantly elevate or suspend ptotic soft tissues.

Accordingly many surgeons continue to advocate formal invasive face lifting in such circumstances, resulting in permanent scars, significant risks and all too often unnatural looking outcomes. We find such invasive methods unnecessary as well performed and technically advanced percutaneous suture lifting can produce very pleasing and natural outcomes without scars.

While some percutaneous suture lift treatment failures have been reported in the literature, the authors have attained very pleasing outcomes using some of the innovative percutaneous suture lifting techniques in the manner outlined in this chapter. In cases of moderate to heavy submandibular fat accumulation, significantly improved suture lifting outcomes are likely if prior or contemporaneous submandibular liposculpture is undertaken.

Finally it worthy to observe that utilizing minimally invasive techniques places a high demand on the innovative instincts and skills of the treating surgeon. Patient expectations are for a significant esthetic facial enhancement to be achieved without the imposition of scars. Limited surgical field access makes this objective particularly challenging. Non-invasive procedures such as percutaneous suture lifting generate the quest for creative design that inevitably requires review and adaption. Ultimately elegant procedures yielding excellent surgical results predominate and are in turn a tribute to those surgeons who both invent and successfully modify them.

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